

**GGERI: Review of  
Methodologies and Procedures for  
Baseline Assessment, Validation,  
Monitoring, Verification and  
Certification**

April 2001

# **GGERI: Review of Methodologies and Procedures for Baseline Assessment, Validation, Monitoring, Verification and Certification**

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April 2001

## **Environmental Policy and Institutional Strengthening Indefinite Quantity (EPIQ) Contract**

*Partners:* International Resources Group; Winrock International; and Harvard Institute for International Development

*Subcontractors:* PADCO; Management Systems International; and Development Alternatives, Inc.

*Collaborating Institutions:* Center for Naval Analysis Corporation; Conservation International; KNB Engineering and Applied Sciences, Inc.; Keller-Bliesner Engineering; Resource Management International, Inc.; Tellus Institute; Urban Institute; and World Resources Institute

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## Abbreviations

BAVMVC	baseline assessment, validation, monitoring, verification and certification
CCAP	Center for Clean Air Policy
CCCC	Climate Change Coordination Center (Kazakhstan)
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
COP/MOP	Conference of the Parties/Meeting of the Parties
EIA	Environmental Impact Assessment
EPIC	Environmental Policy and Institutions for Central Asia Program
ERU	emission reduction unit
ERU-PT	emission reduction unit purchase tender
GEF	Global Environment Facility
GGERI	Greenhouse Gas Emission Reduction Initiative
GHG	greenhouse gas
GOK	Government of Kazakhstan
IACCC	Interagency Commission on Climate Change
IPCC	International Panel for Climate Change
JI	Joint Implementation (Art. 6)
KEGOC	Kazakh Electricity Grid Operating Company
OCT	Oregon Climate Trust
OECD	Organization for Economic Cooperation and Development
PCF	Prototype Carbon Fund
TCAPP	Technology Cooperation Agreement Pilot Project
UKETG	UK emissions trading group
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Program

# **Executive Summary**

## **Purpose of the document**

This document aims to create the basis for the development of high quality national criteria and processes for tasks related to baseline assessment, validation, monitoring, verification and certification (BAVMVC) that are to be administered by Kazakhstan's Climate Change Coordination Center.

The study reviews existing studies, assesses current capacities within Kazakhstan to carry out tasks related to BAVMVC and provides a gap analysis of procedural, technical and institutional issues.

## **Intended audience**

The intended audience of this document are other experts and stakeholders that are involved in the design and operation of a national JI/CDM based climate change mitigation program. The intended audience does not include potential project developers, foreign investors and other stakeholders. These groups will be the focus of the next document that is to be delivered under this contract which will deliver the proposed procedures for BAVMVC related tasks.

## **Introduction**

Methodologies and procedures for baseline assessment, validation, monitoring, verification and certification are critical elements in the design of national programs for the production of emission reductions that count towards the emission limitation objectives of Annex I countries under the Kyoto Protocol.

In the view of the Government of Kazakhstan's application to voluntarily become an Annex I country, the design of these BAVMVC procedures are written for application under the CDM as well as the JI instruments.

The Climate Change Coordination Center (CCCC) manages the emission reduction production process in Kazakhstan and thus controls:

- a) the environmental soundness of certifiable emission reductions that are produced in Kazakhstan as well as
- b) a large share of the costs and values that are associated with the implementation of activities related to BAVMVC activities.

The high-quality design of BAVMVC related activities on the program level is a contributing factor for the production of competitive emission reduction units (ERU) as well as certified emission reductions (CER) by reducing ERU/CER production costs and uncertainty for investors thus ultimately attracting new sources of capital to Kazakhstan.

While the emerging methodologies and procedures for validation, monitoring, verification and certification are derived from existing practices elsewhere, the methodologies for the construction of baselines seem to be specific to this application, triggering the development of new methods from the ground up.

### **Task 1: Review of existing studies**

A number of recently started programs that seek to produce/purchase ERU/CER have introduced criteria for the conduct of BAVMVC related activities that are driven by the guidance provided by the UNFCCC negotiation process. The World Bank's PCF and the Dutch government's ERUPT program provide the most sophisticated approaches.

The consultant observes that new market entrants seem to be willing to follow these procedures and thus create convergence of BAVMVC related guidelines. The rationale for this development is that new market entrants seek to omit the costs of developing their own procedures and are willing to put their trust into the credibility of the work existing market participants (this applies to the ERUPT program as well as the PCF which have both put significant resources into the development of baseline methodologies and procedures).

However, according to the consultant's view, there is not enough experience to move towards that kind of standardization. While these criteria are good and deserve further consideration in the context of CCCC's effort, they require some additional modification. In particular, they do not fully exploit possible standardization and are not specific to project-site country conditions. This means, that further modification offer significant potential to reduce BAVMVC related costs. While Kazakhstan's national program should be driven by lessons learnt elsewhere, these need to be improved further.

### **Task 2: Existing capacities related to BAVMVC**

CCCC can draw upon a range of studies and assistance efforts that provide some of the building blocks for high quality BAVMVC related criteria. The focus of these efforts have been to assess the potential for introducing/disseminate a number of climate mitigation technologies within Kazakhstan, including energy efficiency, wind and other renewable energy technologies. These efforts have been successful in determining relevant project types for climate mitigation in the electricity and heat generation sectors, providing detailed baseline data and addressing barriers to the implementation of climate mitigation projects.

These efforts have also build national constituencies for the implementation of a national climate mitigation program. Relevant stakeholders have been identified, networks were built and qualified professionals involved.

In the context of a preceding effort, a project developer's manual has been developed. This represents a first attempt to approach BAVMVC related activities with a program-level approach. It addresses key BAVMVC related issues and demonstrates that capacities for designing BAVMVC related activities exist.

In addition to what can be learned from existing projects, the consultant recommends to use a questionnaire in order to obtain a better understanding of the capacity within the private sector to engage in BAVMVC related activities.

### **Task 3: Gap analysis**

Based on the analysis of existing capacities, the consultant identified a number of procedural, technical and institutional gaps that need to be closed to create a successful and efficient national climate mitigation program. The consultant identified these gaps and suggests follow-up activities to close these gaps, which will be the substance of future activities under this contract. The consultant identified nine areas that need to be addressed:

1. A manual for BAVMVC related activities must be based on prescriptive procedures; it is to become a key reference document for CCCC.
2. CCCC needs to adopt a concrete institutional arrangement for the conduct of BAVMVC related activities. This arrangement should also be documented in an operations handbook.
3. BAVMVC related tasks need to be integrated with existing procedures for the licensing of equipment considering that the approval process for baselines, protocols for validation and monitoring are closely related to the licensing process of equipment.
4. CCCC should provide an easy to use interface for BAVMVC related activities for all stakeholders, i.e. by operating an internet-based platform that provides access to key resources, data, projects under review, technical manuals as well as service providers. This would effectively reduce participation barriers, increase program credibility and streamline program operation.
5. CCCC should launch a data management initiative that would make relevant, already existing information/data available to interested stakeholders. Certain data, i.e. related to baseline information should also be pre-validated by relevant government authorities to reduce baseline development costs for project developers.
6. CCCC should issue technical manuals that define binding procedures for the conduct of BAVMVC related activities. These manuals could be validated by a qualified third party which would reduce risks related to the non-recognition of emission reductions that are generated under the oversight of CCCC further.
7. CCCC should establish a roster of qualified experts to execute BAVMVC related tasks. Creating such a roster and involving experts from that roster in the design of BAVMVC related tasks would add critical capacities to the operation of a national climate mitigation program.
8. The consultant was not able to identify the legislative/regulatory basis for the operation of a national climate mitigation program. If not existent, the consultant recommends to launch a process that would create this basis.



# **1. Background**

As part of the US Agency for International Development's Environmental Policy and Institutions for Central Asia (EPIC) Program,<sup>1</sup> EPIC-GGERI is aiding the Climate Change Coordination Center (CCCC) and the Government of Kazakhstan in the establishment of rules and procedures for the use of Joint Implementation and/or Clean Development Mechanism projects in Kazakhstan.

Clear procedures are needed to create a comprehensive, fair, transparent system of project preparation and review. These include standardized methodologies and procedures for baseline assessment and validation, calculation of ERU/CERs as well as for subsequent verification and certification of carbon credits and associated forms. The Inter-Agency Commission on Climate Change should endorse the methodologies and procedures developed, recommend to GOK to approve them and take the lead, through the Climate Change Coordination Center, in implementing the regulations needed to establish a system. Criteria for evaluating projects will be based on JI/CDM investment priorities, technical merits, and financial benefits of projects. Standardized methods of calculating emissions reductions based on IPCC guidelines are needed for different project types defined in the country's priorities. These terms of reference (TOR) propose that an international expert in BAVMVC review best practices and make recommendations to the Climate Change Center on how to proceed with developing Kazakhstan's own standard methodologies and procedures.

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<sup>1</sup> The Environmental Policies and Institutions for Central Asia (EPIC) Program of the US Agency for International Development Central Asian Republic (USAID/CAR) Mission is implemented as a Task Order under the USAID Global Environment Center's Environmental Policy and Institutional Strengthening Indefinite Quantity Contract.

## 2. Approach

### 2.1 The role of BAVMVC in the JI/CDM project development cycle

Figure 2.1 displays costs and value-added components in the production cycle for JI/CDM-eligible certified ERU/CER.

**Figure 2.1 Costs and value-added in the ERU/CER production process**

Steps	Project-level	⇒	Program-level	⇒	JI/CDM-level	⇒	Sale
Costs	<ul style="list-style-type: none"> <li>– Technical abatement costs</li> <li>– Costs to achieve mandatory side benefits</li> <li>– Quality costs</li> </ul>		<ul style="list-style-type: none"> <li>– Delivery risk costs</li> <li>– Regulatory costs (including costs for BAVMVC)</li> <li>– Transaction costs</li> </ul>		Adaptation fee		Commissions Profits/ margins
Value added	<ul style="list-style-type: none"> <li>– Produced emission reduction</li> <li>– Mandatory side-benefits</li> <li>– Non-mandatory side benefits</li> </ul>		<ul style="list-style-type: none"> <li>– CER delivery risk reduction measures</li> <li>– BAVMVC related approval</li> <li>– Marketing</li> </ul>		Conform with CDM rules on crediting		Producer rent

Recent analysis conducted by the consultant suggests that the overall costs for baseline assessment, validation, monitoring, verification and certification related activities constitute between 8% (for large projects) to 50% (for small projects) of total emission reduction production costs. Other recent studies put this figure even higher, into the 50% to 70% range. An excerpt of this analysis is included in Appendix 1. It details the composition of ERU/CER production costs and value-added that is created in the various stages of the ERU/CER production process. It is evident that BAVMVC related activities constitute a large share of the overall effort that is required to produce ERU/CERs.<sup>2</sup>

Considering that BAVMVC related activities constitute the majority of costs in the ERU/CER production process, efforts to reduce these costs (at a given price level for ERU/CERs in an international marketplace) directly benefit the seller of ERU/CERs.

<sup>2</sup> The literature on the subject of BAVMVC often refers to BAVMVC related costs as “transaction costs.” This study does not refer to them as transaction costs but as production cost elements. This is in consideration of the fact that the execution of BAVMVC related activities constitute a significant share of the value that ERU/CERs have.

## **2.2 Motivation for program-level BAVMVC rules and procedures**

While the Kyoto Protocol does not stipulate the establishment of a national JI/CDM regulatory framework, there are a number of reasons to implement such a framework. Only a national framework for JI/CDM can ensure that proposed JI/CDM activities are consistent with national development objectives, national agencies are designated to review and approve proposed JI/CDM activities and that the authority to implement, administer and enforce regulations (i.e. related to the verification, monitoring and reporting of project performance as well as tracking the production and transfer of ERU/CERs) is clearly assigned.

Also, there is strong indication that standardization of BAVMVC rules and procedures on the level of national or industry-wide greenhouse gas reduction initiatives contribute to substantial cost savings in the execution of BAVMVC related activities.

There is also strong indication that a high quality design of BAVMVC related rules procedures has significant impact on the value of ERU/CERs that are generated from projects under such initiatives.

## **2.3 Objective of this task**

It is therefore the objective of this task to contribute towards the development of program-level criteria that minimize BAVMVC related production costs and maximize the value of ERU/CERs that are generated within the framework of this program, thus maximizing the financial benefit for ERU/CER sellers and the seller country.

## **2.4 Methodology**

This task is based on the following methodology.

1. Design of a framework that identifies all activities, entities, inputs and outputs that are required to ensure the efficient and high-quality implementation of the BAVMVC process,
2. Review of the relevant international state-of-art in BAVMVC related design issues.
3. Examination of existing capacities related to BAVMVC in Central Asia.
4. Identification of procedural, technical and institutional gaps that need to be addressed subsequently.

### 3. BAVMVC and the Project Development Process

This chapter examines in detail BAVMVC related activities, entities, inputs and outputs in accordance with the forthcoming rules for JI/CDM. It is to be expected that national programs need to follow this process if they seek to obtain ERU/CER status for emission reductions generated under national programs.

#### 3.1 Baseline assessment

Once project concepts/ideas have been identified (including relevant properties related to system boundaries, measurability of emissions and the permanence of emission reductions), a baseline and a crediting period needs to be established. The UNFCCC allows for a range of different baseline methodologies to be used. These methodologies either need to be approved by either the Executive Board or the COP/MOP or they are new methodologies and are submitted for future approval by either the Executive Board or the COP/MOP.

On the basis of a baseline methodology, the project developer (or qualified third parties hired by the project developer) prepares a baseline study for the proposed project. The results of that study are provided in a baseline document. This document becomes part of the project design document, and in accordance with provisions on confidentiality, is made publicly available. There is as of yet, no consensus methodology emerging and it seems that a multi-track approach will need to be followed for the time to come. The consultant identified four mainstream baseline approaches that have been field-tested and deserve further examination. They are referred to as “commercial baseline methodologies” in this study. The consultant also examined post COP-6 language on the mechanisms and assessed the extent to which decisions at COP-6 trigger a redesign of commercial baseline methodologies.

- a bottom-up multi-project baseline (also known as benchmarking or technology matrix approach) approach that has been promoted by the US EPA, tested by the OECD and the Center for Clean Air Policy for a number of project types in the iron and steel industry as well as the Caribbean power generation sector,
- a top-down single project approach that has been developed by the consultant and tested for a number of projects,
- an algorithm-oriented single project baseline approach that has been developed by the consultant for UNIDO and adopted in a modified form by the Dutch ERU-PT program, and
- the single-project baseline approach that has been used by the World Bank for its first PCF project and the baseline approach that has been proposed for the facility for the development of renewable energy in Costa Rica.

#### 3.2 Project concept validation

Validation is the process of independent evaluation of a project activity as described in a project design document by a designated operational entity against the requirements of JI/CDM for which a set of rules and procedures has been defined.

The process for validation is to include a review process for stakeholders. A designated third party (operational entity) is to receive these comments and, based on its own review of documents in accordance with the requirements for validation, that entity is to provide its recommendation with respect to a project's registration as a JI/CDM project activity.

### **3.3 Registration<sup>3</sup>**

Registration is the formal acceptance by the executive board of a validated project as a JI/CDM project activity. Registration is a prerequisite for the verification, certification and issuance of ERU/CERs related to that project activity.

The JI/CDM registration is completed when government approval has been obtained on the basis of the validation recommendation by the designated operational entity.

### **3.4 Monitoring**

Project participants are required to include a monitoring plan in the project design document. This plan needs to provide for the collection and archiving of all relevant data necessary to accurately determine the quantity of emissions reduced and other relevant project aspects. The monitoring plan needs to be based on a methodology that has been previously approved by national JI authorities/the CDM Executive Board and deemed appropriate by the designated operational entity or an alternative methodology that is deemed appropriate (but requires subsequent approval by the CDM Executive Board).

Project participants are responsible for ensuring that the monitoring plan contained in the registered project design document is implemented. Revisions are permitted but need to be justified, validated and approved.

### **3.5 Verification**

Verification is the periodic independent review and ex post determination by a designated operational entity of the monitored reductions in anthropogenic emissions by sources that have occurred as a result of a registered JI/CDM project activity during the verification period. The designated operational entity contracted by the project participants performing the verification shall verify all material aspects of the project related to its emission reduction related performance.

### **3.6 Certification**

Certification is the written assurance by a designated operational entity contracted by the project participants that, during a specific time period, a project activity achieved its anthropogenic emission reductions by sources and other performance indicators, as verified.

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<sup>3</sup> Registration has been added to the BAVMVC process during recent climate negotiations.

## **4. Review of International State-of-the-Art in BAVMVC**

This chapter provides an overview of international state-of-art BAVMVC guidelines and methodologies that are currently in use for JI and CDM projects. In particular, it focuses on

- the guidance provided by document FCCC/SB/2000/10 which represents the latest agreements of the Kyoto Protocol process,
- the guidelines used by already operational programs, including the project preparation documents used by the Dutch government for its emission reduction unit purchase tender (ERU-PT) and the project-cycle process and documents used by the World Bank's Prototype Carbon Fund (PCF),
- a review of capacity building activities towards operational CDM and JI related programs in project-site ("host") countries,
- a review of guidelines that are currently under preparation by new market entrants, such as the UBS fund, and
- a review of practical guidelines and methodologies proposed by relevant stakeholder groups.

These studies already represent a selection of those efforts that offer practical suggestions that are relevant for the implementation of efficient and high-quality guidelines for BAVMVC related activities in Kazakhstan.

### **4.1 UNFCCC guidelines for the CDM**

The document FCCC/SB/2000/10/Add.2 represents the current text by the chairman regarding the technical design of the CDM.

#### *4.1.1 Baseline assessment and crediting periods*

Document FCCC/SB/2000/10/Add.2 introduces a broad range of alternative proposals for the determination and assessment of baselines and crediting periods. It stipulates that a baseline should be considered to be a reasonable representation of the emissions by sources that would occur in the absence of the proposed project activity only if it is derived using:

- a baseline methodology that has been approved by the COP/MOP (or executive board) and the designated operational entities determines that the methodology is appropriate to the circumstances of the project activity and has been properly applied, or
- an alternative baseline methodology, provided that the COP/MOP (or executive board) approve the alternative methodology upon submission by the designated operational entity.

This procedure ensures that the state-of-art in baseline methodologies can evolve. The document already identifies two baseline methodologies: project-specific and multi-project baselines. Project-specific baselines require the assessment of the specific reference case that represents what would occur in the absence of the project activity. The determination of a reference case using this methodology can be applied to other projects if appropriate. Multi-project baselines do not require individual assessment of the reference case but would be determined for a given

project-type and specific geographic area. The document identifies a number of additional criteria, such as:

- multi-project baselines shall be set conservatively to preserve environmental integrity,
- baseline assessment shall ensure that projects do not benefit from national policies which do not contribute to the ultimate goal of the convention (i.e., fossil-fuel subsidies).

On crediting periods, the document introduces a number of alternative proposals, including:

- a single crediting period after which the project is not eligible to further accrue CERs,
- a fixed crediting period (i.e., five years) that can be renewed provided that the designated operational entity determines that the project activity continues to satisfy baseline criteria based on updated data,
- a crediting period that corresponds to the period of validity of the validated baseline; crediting periods can be extended through baseline revalidation; factors that drive baseline validity are subject to review at the end of the crediting period and shall be identified at the outset.

#### *4.1.2 Project concept validation*

Document FCCC/SB/2000/10/Add.2 introduces a detailed procedure for the validation of project concepts. It assigns responsibility to a designated operational entity selected by project participants, and under a contractual arrangement with them, to validate a project activity and any supporting documentation to confirm that the following requirements are met:

- the project has been approved by each party involved,
- the project participants are eligible to participate in CDM project activities,
- the project activity is eligible under the CDM,
- comments by stakeholders have been considered, in accordance with relevant national requirements,<sup>4</sup>
- the project activity has undergone an environmental impact assessment including social impacts, taking into account criteria for environmentally safe and sound technologies as delineated in Agenda 21, in accordance with existing rules, standards and legislation of the host party (or, in the absence of these, appropriate international guidelines and good practice),
- the baseline complies either with approved methodologies (or modalities and procedures for a new methodology,
- emission reductions are additional to any that would occur in the absence of the proposed project activity,
- provisions for monitoring, verification and reporting of relevant project performance indicators are in accordance with relevant provisions,

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<sup>4</sup> According to document FCCC/SB/2000/10/Add.2, Parties, project stakeholders and non-governmental organizations receive 30 to 60 days from the date the project design document was made publicly available for commenting. A designated operational entity selected by project participants for validation purposes is to receive these comments and might be asked to make them publicly available (if so requested by a Party or member of the CDM Executive Board).

- the CDM project activity uses a crediting period that satisfies relevant requirements,
- the project conforms to all other requirements for CDM project activities.

#### 4.1.3 *Project concept registration*

The designated operational entity will review the information provided to determine whether it is sufficient to enable a decision to be made regarding whether to register the project activity. If the information is not sufficient, the designated operational entity may request further information from the project participants, as appropriate, and, where appropriate, provide recommendations for the modification of the methodologies used.

#### 4.1.4 *Monitoring*

Document FCCC/SB/2000/10/Add.2 provides clear guidance on monitoring that includes general procedures for:

- estimation or measurement of GHG that occur (project emissions) and were replaced (baseline emissions) by the project within the project boundary during the crediting lifetime.
- identification of potential sources of enhanced GHG emissions by sources outside the project boundary that are significant and reasonably be attributable to the project activity,
- the collection and archiving of all relevant data necessary to monitor other relevant impacts of the project,
- quality assurance and control procedures,
- procedures for the periodic calculation of reductions of GHG emissions by sources by the proposed CDM project activity, and
- documentation of all steps involved.

The document does not go into specifics but includes a provision for the evolution of best practice monitoring methodologies by stipulating that monitoring plans shall be based on methodologies that:

- have been previously approved by the executive board, provided that the designated operational entity determines that the methodology is appropriate to the circumstances of the proposed project activity and has been properly applied,
- is an alternative methodology proposed for application to a particular project activity, provided that the designated operational entity determines that the methodology is appropriate to the circumstances of the proposed project activity and has been properly applied, and the executive board approves the methodology upon registration,
- represent good monitoring practice.

#### 4.1.5 *Verification*

Document FCCC/SB/2000/10/Add.2 provides clear guidance on verification that includes general procedures for:

- determining whether the project documentation provided is in accordance with the requirements of the registered project design document,
- conducting on-site inspections, of measurements, observation of established practices and testing of the accuracy of monitoring equipment;



- reviewing monitoring results and determine the reduction in anthropogenic emissions by sources based on the data and information used in the project documentation and obtained through on-site inspections, other sources and using calculation procedures consistent with those contained in the registered project design documents,
- verifying that the monitoring methodologies for estimation of reduced anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent;
- identifying any concerns related to conformity of the actual project and its operation with the registered project design document,
- recommending to the project participants appropriate changes to the monitoring methodology,
- providing a verification report to the project participants, the Parties involved and the executive board, and
- making this report publicly available.

#### *4.1.6 Certification*

Document FCCC/SB/2000/10/Add.2 provides clear guidance on how to certify emission reductions from a registered project activity:

- they shall be certified after they have occurred,
- upon receipt of a certification report from a designated operational entity confirming the certification of a quantity of CERs from a CDM project activity, the system administrator working under the authority of the executive board shall:
  - assign each CER a unique serial number,
  - collect all required fees, and
  - transfer CERs to the registry accounts of project participants, as specified by the distribution agreement approved by the Parties involved.

## **4.2 UNFCCC guidelines for JI**

Kazakhstan currently is a non-Annex I country which means that JI rules are not applicable. However, in the light of GOK considerations to voluntarily join the Annex I, the purpose of this section is to inform the GOK regarding the potential merit of being able to use the flexible mechanisms that are reserved to Annex I countries.

The document FCCC/SB/2000/10/Add.1 represents the current text by the chairman regarding the technical design of JI projects. The major differences between JI and the CDM is related to certain pre-conditions for participation and project-level monitoring and validation:

- Participation in JI requires a national system for the estimation of GHG by sources as well as a national registry to account for and track all changes in assigned amounts, ERUs and CERs transferred or acquired.
- At the same time, JI projects do not require validation, registration or verification by an external regulatory body (such as the Executive Board in the CDM context) but leaves it to the government of the ERU exporting country to define its own procedures.

Otherwise, the technical procedures that are to be used for baseline assessment, monitoring and crediting lifetimes are similar.

In summary, under the emerging UNFCCC rules, JI assigns a higher level of authority and program management responsibility to the project-site government. JI also requires the JI project-site country government to put in place a comprehensive emissions accounting system while reducing the regulatory burden on individual JI projects.

Therefore, countries that consider to voluntarily join Annex I should base their decision-making on how they intend to use the flexible mechanisms. If they anticipate that these mechanisms could potentially make a significant contribution to foreign investment, it seems sensible to develop a strong national capacity for the management of GHG emissions and emission reductions with the objective to join Annex I. In the meantime, a national CDM program should be designed in such a way that makes it easily convertible to a JI or even emissions trading system in the future.

### **4.3 ERU-PT**

The Emission Reduction Unit Purchasing Tender (ERU-PT) was issued by the Ministry of Economic Affairs of the Netherlands to purchase emission reduction units from Annex I country JI project activities. The total budget for this tender is equivalent to US\$100 million. While the ERU-PT guidelines are for a JI application, they offer interesting insights considering that they originate from a UNIDO sponsored project to develop operational guidelines for the CDM and that the Dutch government will issue a second tender for CDM countries next year (which is likely to follow a similar approach).

The Dutch government has signed MOUs with a number of Eastern European governments, committing them to allow the transfer of assigned amounts from the first budget period for ERUs that are generated by projects that participate in this tender.

The Dutch government has commissioned the development of a set of guideline documents with the overall objective to present operational guidelines for baseline studies, validation, monitoring, reporting and verification of Joint Implementation projects. The guidelines are intended primarily for use by project developers and validation/verification bodies that seek to submit project ideas to the ERU-PT of the Dutch government. These guideline documents are submitted in the supporting documentation for this study.

In addition to a generic guideline on baseline development, this set of guidelines also comprises specific manuals or workbooks that have been prepared to give specific directions on how to develop project baseline studies and project monitoring for a limited number of selected project categories. The number of such workbooks is intended to increase as time goes by, and is at present represented by anticipated projects in the first round of ERU-PT. Projects that fall partly or completely within this set of project categories are recommended to follow these specific guidelines. If this is done, it will also enable the development of multi-project baselines to be used in future projects. Even though project developers utilize the specific workbooks to make

their project baseline study and monitoring plan, they are also recommended to pay attention to the general guidance provided.

Guidelines for third parties that should be responsible for validation and verification of JI projects are presented in two other volumes. These provide specific organizational requirements for validation/verification bodies, as well as procedural requirements for the performance of validation and verification.

#### *4.3.1 Project preselection*

The Dutch government, together with relevant government authorities in the project-site country jointly select the project ideas that meet some basic criteria related to the financial, economic and technical capacity to successfully implement the proposed project. Only selected projects are then invited to make a proposal including the preparation of a baseline study and monitoring plan.

#### *4.3.2 Baseline assessment*

The ERU-PT guidelines outline a process for the determination of baselines. The result of this process is to be documented in a baseline study which is to be written by the project developers. That baseline study aims to give a transparent picture of what a JI project comprises and what would have happened with and without the project. It furthermore provides the validation/verification body a complete understanding of the relevant factors used for the estimated baseline emissions, project emissions and emission reductions thereof. The guidelines comprise a number of steps for the determination of a baseline:

- Description of project characteristics
- Description and determination of greenhouse gas sources and sinks and system boundaries
- Description of the current delivery system
- Description and determination of key factors influencing project and baseline emissions
- Identification of baselines and selection of most likely baseline
- Estimation of the project emissions
- Estimation of the baseline emissions
- Determination of crediting time
- Estimation of the emission reduction
- Evaluation of additionality

#### *4.3.3 Monitoring and reporting*

The ERU-PT guidelines prescribe the methodology for monitoring and reporting in generic terms. According to the guidelines, the methodology is documented in a monitoring plan, which describe the relevant factors and the key characteristics that will be registered, measured or otherwise monitored by the project organization on a regular basis.

The monitoring plan must incorporate all project factors that are of importance for controlling and reporting of project performance. It should clearly identify frequency of, responsibility and authority for registration, monitoring and measurement activities. The monitoring plan is to be written by the project developer and needs to be validated by an eligible operational entity.

The project organization will annually issue a monitoring report as agreed through the monitoring plan and the ERU-PT contract. The monitoring report shall include all necessary information on the relevant factors and key characteristics and the ERUs claimed for the project over that period.

#### *4.3.4 Project concept validation*

The project developer are required to retain the services of an eligible operational entity for validation, verification and certification purposes. Basis for the validation are the baseline study and monitoring plan.

#### *4.3.5 Verification*

A verification body will regularly review the project performance records and achievements that ERU-PT, Kyoto Protocol and relevant national and international requirements and standards have been met by the project. The monitoring plan in use within the project is the base for this verification. The verification report will identify whether the project as implemented meets the relevant requirements, and verify and report the quantum of achieved emissions reductions to ERU-PT and the host country. If necessary, the verification will request an update of the monitoring plan or project baseline to be used for the next baseline period.

### **4.4 PCF**

The PCF is a World Bank managed closed investment fund that purchases CERs and ERUs from eligible JI and CDM projects for its investors. While the PCF is very responsive to the new guidance emerging from the UNFCCC process, it has developed operational guidelines for BAVMVC related activities. According to the PCF, the production of CERs includes the following steps:

- A baseline study for the project and an explanation of how additionality and other relevant project criteria will be satisfied.
- A Monitoring and Verification Protocol (MVP) for the project.
- Validation of the project design including the project baseline and the MVP.
- Monitoring of emission reductions and other relevant parameters and indicators.
- Periodic auditing of the project and verification that emission reductions have been achieved in compliance with relevant project criteria.
- Certification of verified emission reductions.
- Recognition or registration of the certified reductions by a UNFCCC body.

#### *4.4.1 Baseline assessment*

The PCF does not prescribe the use of a single baseline methodology but emphasizes the importance of credibility as the guiding principle for baseline methodology selection. PCF Implementation Note No. 3 assesses the advantages and disadvantages of a number of methodologies and lays out measures that it seeks to undertake to strengthen quality in baseline assessment.

Under the PCF's approach, baseline studies are an integral part of project concept notes. Thus far, the PCF has published one such detailed baseline study that is based on a project-specific

baseline methodology, the selection of a range of other possible project alternatives and a financial criteria to create a relative ranking of all project options and assess the project's additionality.<sup>5</sup>

#### 4.4.2 *Project concept validation*

According to the PCF, validation has emerged as a key stepping stone in developing credible greenhouse gas emission reduction projects. Validation corresponds with the requirement under Art. 12 of the Kyoto protocol that project activities be "certified." It also responds to project developers' need for assurance that their projects meet Kyoto Protocol and other relevant requirements and is thus likely to generate emission reductions that will be acceptable under the emerging regime. A positive validation opinion, issued by an independent third party, is usually the final step before negotiations between a project developer and a host country. Validation has therefore been accepted by many as a part of the proposed project cycle for the CDM.

In an attempt to better understand and streamline the validation process, the PCF developed preliminary guidelines for the validation process, a checklist of project requirements, and a template for a validation report and opinion. This body of work, collectively referred to as the Preliminary Validation Manual (PVM), is based on experience with several greenhouse gas projects including the validation of the Liepaja Regional Solid Waste Management project, a PCF project in Latvia, and the verification of the ILUMEX project, a completed AIJ project in Mexico.

#### 4.4.3 *Monitoring and verification*

PCF Implementation Note No. 4 addresses issues related to monitoring and verification.<sup>6</sup> The PCF requires that a project-specific MVP is prepared for each PCF project. The MVP will be based in generic guidelines, rules, or standards, in particular UNFCCC guidelines, when they exist. But the MVP itself must be specific to a particular project and its circumstances, and it will be prepared as part of the project's design. The purpose of the MVP is to guide the monitoring and verification process for the project. The MVP will be agreed with the project participants and will be part of the project agreement between the parties to the project.

The MVP will build on the baseline study for the project. It will ideally include formulas or algorithms for calculating baseline and project emissions, which can use data collected during the operational phase within and outside of the project boundaries. The MVP will include clearly defined indicators that allow those concerned to observe and verify continued conformance of the project with relevant project requirements and criteria, including the contribution of the project to achieving sustainable development.

The MVP contains detailed instructions regarding the data to be collected and the monitoring and measurement procedures. The MVP will list indicators to be measured (e.g., fuel consumption), instruct how to take measurements, what records to keep, how to process documents, and who will be responsible for these activities. The MVP contains also instructions for auditing and verification. The MVP will, for instance, specify when auditing and verification activities take

<sup>5</sup> The PCF Implementation Note No 3 and a sample baseline study are included in the supporting documentation for this study.

<sup>6</sup> This note is included in the supporting documentation.

place, which data and installations have to be accessible, which data sensitivities exist and how to deal with them.

The MVP may also include instructions for a management system and training requirements to support the monitoring activities.

The PCF expects that over time MVPs become a standardized document, which can be applied to similar projects without much effort. The development of MVPs thus contributes, in a bottom-up fashion, to the drafting of generic rules for monitoring and verification of JI and CDM projects.

## **4.5 Criteria from other operational CER trading related programs**

### *4.5.1 UKETG*

The objective of the UK Emissions Trading Group is to create an operational emissions trading system in the UK. The UKETG secretariat expects that around 80 companies will participate in this scheme.

The UKETG does not allow for the import of ERC until the rules for CDM/JI are agreed. The UKETG will follow decisions on rules that emerge from the international negotiations. The UKETG allows ERC from JI projects that are implemented within the UK. However, the BAVMVC related guidelines for such projects is very general and does not deliver new insights in the context of this study.

### *4.5.2 The GHG protocol initiative*

The GHG protocol initiative is a collaborative effort between industry, the public sector and NGOs to develop a suite of consistent and operational GHG emission inventory methods that are tailored to a variety of applications including the project based mechanisms.

While the initiative does not seek to develop BAVMVC criteria itself, the inventory methods supply an accounting methodology, thus providing the basis for the quantitative treatment of emissions and emission reductions.

The methods advice users on how to choose system boundaries, how to measure emissions from different kind of point sources and provides reliability estimates for different measurement techniques.

Manuals that guide the creation of emission inventories can be obtained from [www.ghgprotocol.org](http://www.ghgprotocol.org). A copy of the current (road testing) version of the manuals are enclosed in the supporting documentation for this study.

### *4.5.3 Oregon Climate Trust*

The Oregon Climate Trust has issued a request for proposals to buy emission reductions from qualified project proposals. It uses a set of its own criteria that address issues related to baseline assessment, monitoring and verification. The OCT request does not provide detailed procedural nor project-type specific BAVMVC related criteria. While there is no doubt that the OCT seeks

to purchase high quality emission reductions, the lack of detailed rules can be explained by the proposed small size of the scheme which is US\$960,000.

Instead, OCT places the burden to propose high quality procedures on project developers.

#### *4.5.4 UBS fund*

The UBS fund is not yet operational and does not have criteria developed to guide its investment in emission reduction projects. However, on a general level it has already been determined that the UBS fund will only invest in projects that are implemented in countries that have a strong national program for the production of emission reduction credits. According to an advisor to the UBS fund, a strong national program is a key element to reducing transaction costs as well as investment risks for project investors.

### **4.6 The contribution of other stakeholders to BAVMVC issues**

#### *4.6.1 National Strategy Studies Program*

The World Bank, together with a number of Annex I governments currently implement national strategy studies for the use of flexible instruments. A number of Eastern European and Central Asian countries have participated in this program and produced national strategy studies documents. These studies largely focus on project pipelines for the CDM/JI and neither on criteria nor institutional structures for the operation of national CDM/JI programs.

These studies itself are therefore not useful in the context of this study unless they have contributed to building national capacity and follow-up activities. However, the consultant does not have knowledge about whether national strategy studies have produced such follow-up activities in Central Asia at this point.

#### *4.6.2 UNIDO*

UNIDO is engaged in a number of activities to build capacity related to BAVMVC related issues. Most relevant is one effort that is geared towards developing operational BAVMVC guidelines for industrial projects.

The guidelines project has lead to a draft report that proposes a generic set of guidelines for industrial projects. One of the objectives of this project is to develop tools to assist non-expert users with the application of guidelines in the context of project development. For this reason, the guidelines are structured in a modular and algorithmic fashion. The algorithm is based on a generic standard procedure applicable to all project types. Individual steps within this general procedure are project-type specific. The first phase of this project (design of the algorithm) has been completed (a modified version of this approach has been used in the context of the design of the Dutch ERU-PT program). The second phase will focus on the actual development of support tools for BAVMVC activities. These will be very useful for the purposes of CCCC.

#### *4.6.3 Center for Clean Air Policy*

The Center for Clean Air Policy (CCAP) has recently conducted a comprehensive study on the use of regional multi-project baselines in the Caribbean power sector. The study was an attempt

to simplify the baseline development process for a class of project types (measures that replace electricity consumption from fossil fuels).

The study concludes that regional multi-project baselines offer a viable solution to reducing baseline development costs while being environmentally sound if such baselines can be supported with good data. Considering the costs of developing multi-project baselines, they should only be considered for projects with high replication potential.

At the same time, a multi-project baseline is applicable cross-nationally thus increasing replication potential (considering wider coverage of the multi-project baseline).

#### **4.7 Conclusions**

Existing programs offer valuable insights and guidance into the design of BAVMVC related criteria as well as operational manuals guiding BAVMVC related activities. The two most advanced programs—the Dutch ERU-PT and the World Bank’s PCF—are comprehensive and supply highly relevant material that should be adopted for use within CCCC.

However, both PCF and ERU-PT criteria are written from the perspective of ERC buyers/project investors. They therefore lack the CER producer-country perspective and therefore need—at a minimum—be revised accordingly. For example: there is little practical guidance on the integration of local sustainable and economic development issues in BAVMVC activities (which is not surprising in the ERUPT context, considering that it applies to JI only).

In addition to criteria developed by actual purchasers of CERs, other stakeholders have made relevant contributions to examining critical design elements of BAVMVC activities. Most noteworthy in that respect appear to be the GHG protocol imitative and its contribution to accounting issues, UNIDO’s efforts to develop operational guidelines and tools for industrial CDM projects as well as CCAP’s contribution to assess the feasibility of multi-project baselines. The consultant recommends to draw from these existing experiences, harmonize them with Kazakhstan’s capacities to operate a national CDM program as well as its preferences for the use of the CDM to meet national economic development and foreign investment priorities. To the extent that Kazakhstan intends to focus on project-types that have not received the attention of analysts thus far, the consultant also recommends to develop default methodologies for such project types (i.e., industrial energy efficiency and wind power).



## **5. Existing Capacities Related to BAVMVC in Central Asia**

The consultant reviewed the following documents in the preparation of this chapter:

- EPIC's project developer's manual
- Kazakhstan's first national communications to the UNFCCC
- GEF/UNDP Djungar Gate Project Brief
- GEF/UNDP Energy Savings Project Brief
- Framework for Climate Change Technology Cooperation in Kazakhstan
- Terms of Reference for Almaty Region Baseline Assessment Study
- Kazakhstan National Country Study

Most of these technical assistance projects/program focus on project-type specific issues in a range of technology fields. Thus, they provide valuable insights on the status of various sectors that are relevant from a GHG emissions perspective, barriers to the mitigation of climate change in these sectors and projections of anticipated developments.

However, these efforts do not take an integrated approach to building capacity for regional, program-based criteria for BAVMVC related activities. The only document with a clear focus on program-based criteria for BAVMVC related activities is the project developer's manual. It represents the most sophisticated treatment of BAVMVC issues with a regional and integrative focus and should therefore provide the starting points for further efforts into that direction. The consultant therefore recommends to integrate information that is available from project-type specific assistance projects into the design of program-based criteria for BAVMVC related activities.

This chapter is divided into three sections that focus on the following issues:

- a) providing a detailed assessment of the project developer's manual; the objective of this assessment is to define the current status-quo and identify next steps in the construction of a set of integrated procedures and guidelines for BAVMVC related activities,
- b) assessing information related to BAVMVC activities from project-type/ technology-specific assistance projects,
- c) providing a questionnaire that is to be filled out by potential JI/CDM project developers and other stakeholders to obtain a first hand understanding of their capacity to design, manage and implement BAVMVC related tasks in the process of project operation and development.

### **5.1 Review of the "Project Developers Manual for Central Asia"**

#### *5.1.1 General review*

The manual takes a useful approach to the sequencing and design of technical issues to carry out BAVMVC related activities. It includes sections for all relevant BAVMVC related issues and identifies the related key technical issues. However, the review determined that the manual lacks

a thorough treatment of related institutional issues and does not provide sufficient prescriptive guidance, recommendations and conclusions.

*The institutional dimension of BAVMVC activities are not addressed in specific terms.* While the manual discusses institutional issues in general terms it does not assign decision-making authority, third-party review/assessment and execution of such activities in the national context of Kazakhstan. In other words, the manual ignores the institutional dimension of the BAVMVC process.

A national program must address and document the institutional choices and address the following questions:

- Who is required to carry out a BAVMVC related activity?
- Who decides on the eligibility of projects, project validity, baselines, monitoring and verification protocols?
- Who has the authority to validate a project concept?
- Who has the authority to certify emission reductions?
- Who and how are related records stored and maintained?
- What is the regulatory basis for the above?

Chapter 5 discusses the legal basis for market-based environmental policy on a more abstract level. However, chapter 5 could be an excellent blue-print for the design of the regulatory basis of the CCCC.

The consultant recommends to launch a process with the objective to draft laws, directives or regulations that address all of the above issues and provides the legal basis of the CCCC in the future. A similar process has been conducted and just been concluded in Costa Rica.

*The manual lacks prescriptive conclusions/recommendations.* The purpose of a manual is to guide users through an application process. It has to be easy to read (including for non-experts) and has to be prescriptive in terms of guiding a user through an application.

While the manual is very informative and provides accurate technical information it does not provide information in an instruction-based format. The reader obtains insights into relevant issues and design options but is left without concrete instructions that could guide him through the CO<sub>2</sub> engineering process. These gaps will be addressed in more detail in chapter 6.

### 5.1.2 Review of chapter 2

Chapter 2 of the manual discusses issues related to project identification, preparation and management. This step in the emission reduction production cycle is conducted prior to BAVMVC activities. Considering that project identification is linked to BAVMVC related issues (considering that the choice of baseline determines the potential value added to a project due to emission reductions) the chapter is reviewed here.

*How are prospective projects identified?* The project identification process that is described here assumes implicitly that projects are being developed for the primary purpose of reducing

emissions and that all projects that could qualify for JI/CDM are known to the government. This is often not the case: the interest to pursue a project development is most often driven by other investment considerations and not knowing about the benefits that JI/CDM offers to a concrete project idea means that project developers do not look for such additional benefits. This could mean that project ideas that would have met the commercial investment criteria of an investor had they known about the additional value that is derived from the production of emission reductions are buried before they ever had the chance to become known to the government. Related to this is that project developers could be quite unaware of the scale of the potential benefits that is offered by reducing emissions and lack the capacity to include this aspect in their investment analysis.

The implication is that a national program needs to take action to avoid that good project ideas are lost because of the lack of knowledge about the JI/CDM in general and how to assess the potential benefits offered by reducing emissions in particular.

This means that the project identification stage should not be reactive (project ideas come to the government/are introduced by the government) but proactive (the government takes initiative to inform and encourage third parties to submit project ideas based on clear criteria that describe what kind of project has a good chance of being eligible).

*A pre-selection stage should be included to help to weed out unrealistic project ideas.* Chapter 2 omits one important aspect related to the pre-qualification of project ideas. While it is rather simple to identify an interesting project idea, it is important to obtain a quick assessment of whether the proposing parties have the resources to actually develop the idea into an operational asset. Not doing so would tie up scarce program resources with project ideas that never have a chance of being realized.

Such a pre-qualification stage is included in the Dutch ERU-PT program. The Dutch program operators only request more detailed project information (such as a baseline study etc.) when the project proponents are able to demonstrate that they possess the technical expertise and financial resources that are required to pursue a project idea through its development stages.

*A national program does not need to assist in financial and risk assessment.* The review of the manual does not just focus on gaps but also on an excess of issues. Sections 2.2 and 2.3 are such excess. A national program does not need to provide guidance on project budgeting, financial and risk analysis. It is up to project developers to determine whether a project (with or without the added value generated by emission reductions) meets their investment criteria. In fact, the capacity to do so should be checked during pre-qualification.

*EIA should be consistent with existing national rules.* Section 2.4 creates the impression as if the introduced EIA procedures for investment appraisal are new and not rooted in existing regulations (the consultant came to that conclusion because of the lack of reference to existing laws and regulations in the text). It does not seem advisable to burden JI/CDM with new rules for EIA if no related capacities nor regulatory framework exist. The JI/CDM can not be “all things to all people.” Instead, the EIA process should be based on the practices, frameworks and authorities that apply to baseline investment options as well. Otherwise, the administrative

overhead could swallow most of the value generated by emission reductions, thus providing incentives to project developers to proceed with baseline investment options.

### 5.1.3 Review of chapter 3

Chapter 3 of the manual discusses issues related to calculating GHG emission reductions from JI/CDM projects. It reviews issues related to baseline determination, crediting times, methods for calculating emissions, case studies as well as country-specific emissions related data.

*A manual on baseline methods must be prescriptive.* Chapter 3 discusses baseline methodologies but does not provide a prescriptive solution. In its current format, chapter 3 does not facilitate the baseline development process for project developers. Instead, it informs readers on the status of the debate on some of the baseline methodologies that are currently being discussed.

The consultant recommends to change this section accordingly. Its primary focus should be to lay out the working steps that a project developer needs to go through in the baseline development process and to export supporting information and “academic” discussion of relevant issues to footnotes and appendices.

*Baseline assessment is a sequence of steps that should begin with the definition of system boundaries.* In its current format, the section on baselines is not organized systematically. Baseline assessment should be understood as a sequence of steps beginning with the definition of system boundaries for the JI/CDM project for which the baseline is developed. In the absence of a systematic approach it is very difficult to establish an objective process for validation, verification or comparison purposes.

Therefore, the section on baselines and crediting times needs to be streamlined, i.e. into a step-by-step format that guides project developers through the baseline process. Such a process is provided by i.e. the ERU-PT criteria and such a process will be developed in the context of future tasks under this contract.

*Baseline methods need to be suited to national conditions.* The manual does not make explicit reference to the multitude of different baseline methodologies that exist and how different types of baseline methodologies are suited for different kinds of projects and JI/CDM program layouts.

The consultant recommends that prior to selecting a specific baseline methodology, a workshop involving all relevant stakeholders needs to discuss issues related to how the government seeks to use JI/CDM, i.e.:

- How many projects it anticipates to implement,
- whether it seeks to replicate specific project types in larger numbers,
- which national economic and development objectives should be promoted by JI/CDM, and/or
- what the expected average project size is.

The determination of these issues will determine what kind of baseline methodology to choose. For example: If the replication potential for wind projects is considered to be high and if the

implementation of wind projects addresses important national priorities it would be rational to create a simplified/standard procedure (i.e., develop a multi-project baseline for wind projects), thus reducing the burden of baseline development for wind project developers.

*The provision of constants, conversion factors and other relevant data can make a key contribution to standardizing the baseline development process.* Chapter 3 provides a wealth of information on relevant constants, conversion factors and performance data of existing GHG emission sources. This information can be very useful to project developers, especially when it is delivered to project developers when needed in the process of preparing baselines and data has been approved/cleared by relevant government agencies.

In its current format, the data is not structured and it is unclear whether the data that is supplied in the manual would be accepted by relevant government agencies or would require additional verification.

The consultant recommends to structure this data and integrate it into a step-by-step approach in the baseline development process. Also, the consultant proposes to initiate a process by which the government in cooperation with relevant stakeholders would pre-validate key data, i.e.:

- the government could validate baseline data for base load electricity in Kazakhstan; this data could then become the default data for everyone who is replacing electricity from the grid in the context of a JI/CDM measure, or
- the government could validate key conversion factors that are either generic (from the IPCC) or draw from higher quality national data (national communications, private sector submissions (validation and verification bodies).

In the context of future tasks under this contract, this data structuring, validation and integration effort should first be executed in paper format. In the future, it should be made available in the context of a web-based CCCC program platform.

*Case study data should be captured systematically and used to improve/update existing data.*

The case-studies reveal a wealth of information that is not only useful in the context of the individual projects but that can be applied to other projects as well. The data that emerges from case-studies should be synchronized with other existing data to ensure data consistency and comparability.

The consultant recommends to launch a process for data organization, reporting, storage and management that should be integrated with existing efforts to maintain national energy statistics. Such a database would serve more than one purpose:

- it could improve energy planning in general,
- it would provide a key stepping stone on the way to introducing emissions trading to Kazakhstan (which requires strong national inventories of emissions),
- it would support the improvement of Kazakhstan's national communications under the UNFCCC, and

- it would improve CCCC's program efficiency and lower the costs of participating in JI/CDM activities for project developers.

*Efforts to conduct emissions quantification must discuss measurement techniques.* The case studies in chapter 3 make reference to a range of data items, such as fuel use, electricity consumption or calorific values. The chapter does not discuss how this data was generated or which options in fact exist to generate this data and how reliable this data is.

However, to ensure that data can be assessed properly and to ensure that data can be verified, the manual must discuss which methods are allowed to generate this data.

The consultant recommends to list standard measurement methods for different types of emission sources. The GHG protocol initiative for example includes listings of such measurement methods and their estimated reliability.

#### *5.1.4 Review of chapter 4*

Chapter 4 discusses issues related to valuing GHG emission reductions as a financial asset. Producers in every market must clearly understand their market and the demand for the product that they are producing. While chapter 4 tries to explain the market for emission reductions and tries to identify some of the current buyers, market intermediaries and market drivers it fails to produce the information that potential producers require before prior to making investment and production decisions. Such information would include:

- a market outlook in terms of demand and prices,
- current and future production cost structures for emission reductions,
- competition by other suppliers,
- market segmentation issues, and
- issues related to the quality of emission reductions.

A detailed market study has recently been launched by the World Bank–financed Facility for Renewable Energy Resources in Costa Rica. The consultant recommends to launch a process that would deliver a similar product to the CCCC and to put in place a mechanism that would monitor new market developments and update the market study in regular intervals.

#### *5.1.5 Review of chapter 5*

Chapter 5 discusses in detail legal and contracting issues in market-based environmental policy. This chapter provides a solid discussion of relevant legal design issues that should provide the basis for a law/directive/regulation in Kazakhstan to govern the operation of the CCCC. It also discusses the impact of certain design options on program effectiveness.

The consultant recommends to launch a process that is assisted by a team of international and domestic lawyers to draft a document that could provide the legal basis for CCCC. This document should be sensitive to existing laws, requirements imposed by relevant international regulations such as the UNFCCC and investment law. Considering that this document will define the institutional arrangements for CCCC and the process by which emission reductions are

generated and recorded, it also needs to be sensitive to operational issues and encourage participation in the CCCC.

#### 5.1.6 Review of chapter 6

Chapter 6 discusses issues related to evaluation (validation), monitoring, verification and certification (here referred to as VMVC) as applicable to JI/CDM projects.

Simply stated, VMVC activities are crucial steps in the production process of emission reductions. As explained in chapter 3 of this study, the costs that are incurred to conduct VMVC activities are part of the production costs for emission reductions.<sup>7</sup>

*Harmonize the language of the manual with superceding definitions supplied by the UNFCCC process.* The manual introduces its own definitions for VMVC and includes the term “evaluation” which has been substituted with the term “validation” in the UNFCCC language. Considering that the UNFCCC process has delivered definitions for the terms used here, it seems excessive to include a self-made definition in the manual.

The consultant recommends to use the standard definitions provided by the UNFCCC process. They are included in the glossary of this study.

*VMVC costs are part of the production costs and need to be recovered through sales of ERU/ERC.* The manual discusses costs related to VMVC activities. Considering that they are part of the production costs, they need to be covered by the investor and recovered through the revenue from the sale of ERU/ERCs. This means that VMVC costs need to be properly assessed and included in the pricing strategy.

*VMVC costs are controlled on the program level and vast cost reduction potentials can be realized through efficient program design.* The manual identifies VMVC related costs as 5–10 percent of total project costs. This corresponds well with the consultant’s observation that these costs amount to 50–70 percent of the financial value of emission reductions (depending on the kind of project and the relative contribution of emission reductions to overall project value, these two numbers could be somewhat similar).

However, the manual fails to mention that there is a vast cost reduction potential for VMVC related activities and that such cost reduction measures (i.e. by means of standardization and other measures that are suggested in this study) are largely controlled by the design of the CCCC.

VMVC related costs can be reduced if an efficient program design is put in place. Therefore, considering the high proportion of VMVC related costs in total production costs and considering that VMVC related costs are largely controlled on the program level, reducing these costs by

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<sup>7</sup> Quite frequently in the existing literature, these costs are referred to as transaction costs. According to the view of the consultant, that terminology is confusing. VMVC are essential steps that need to be conducted in order to produce emission reductions. The quality of implementing VMVC activities has significant impact on the value of emission reductions that are created.

designing an efficient national program is a major source of competitive advantage in this market.

*VMVC activities need to be described in more detail, separate from each other and in a project-type specific way.* Chapter 6 properly identifies the steps that need to be taken to implement VMVC activities in general. However, it fails to provide sufficient detail to be operational in the context of a single project activity. Also, it treats all VMVC related activities in one section. The consultant recommends to include separate sections for validation, monitoring, verification and certification. These activities are implemented in different stages of the project development process, are based on a different set of documents and are eventually conducted by different entities.

Also, the information provided in the manual is too generic and not all identified sub-activities need to be implemented for all projects. Project developers are likely to feel over-burdened when confronted with long lists that demand from them to pick and choose whatever item applies for their project activity.

The consultant recommends to draft separate VMVC protocols for different project types.

*The organizational process for the conduct of VMVC activities needs to be defined clearly.* The execution of VMVC activities requires action by different stakeholders in the process including project developers, government authorities, independent third parties, NGOs and the affected public. The manual fails to identify a process that organizes this process and establishes functions for these stakeholders.

## **5.2 Review of project-type specific assistance projects**

It is the consultant's overall assessment that project-specific assistance projects have placed the largest focus on baseline related issues. There is very little explicit information related to project concept validation, monitoring, verification and certification of emission reductions. However, project baseline related information is highly valuable. The consultant recommends to capture this information in the context of a data management system that is to be developed.

### *5.2.1 US Country Studies Program: Support for national action plan*

This study includes a detailed assessment of key mitigation options including detailed technology assessment, baseline assessment, quantification of projected emission reductions and assessment of verifiability of emission reductions.

Baseline information is available for the electricity and heating sectors on an aggregate level. The data can be used for the construction of multi-project baselines for projects that replace electricity and heat from fossil-fuel generators or replace the use of electricity and heat.

Considering that Kazakhstan's government, power sector companies (KEGOC, KazNIIMOSK, KazNIPIENERGOPROM) and other stakeholders have been involved in the generation of this data, it could serve as the basis of developing pre-approved data for purposes of baseline development.



However, the future-oriented data contained in this study also highlights the need for instigating a data management process: some of the projections made in the study (parts of which originate from a study conducted in 1996), i.e., related to future electricity prices, need to be updated.

#### *5.2.2 US Country Studies Program: National GHG mitigation assessment*

This study includes a detailed modeling effort to project future GHG emissions in Kazakhstan and to quantify the impact of GHG mitigation measures. The study includes detailed, project-level data for electricity and heat generators, a project portfolio of planned investments and lists of assumptions that are expected to drive future developments in the energy sector as well as an assessment of data validity.

The study, which was completed in 1996 provides a very useful reference point for baseline development especially when it is compared to actual developments that have occurred since. As already pointed out above, this study provides a wealth of information that should be incorporated into a data management system to facilitate the work of the CCCC and project developers in the context of BAVMVC related activities.

#### *5.2.3 GEF/UNDP project briefs on wind power market and energy efficiency projects*

These two project briefs provide highly valuable information related to baselines that could be applicable for the project-types wind power and industrial energy efficiency. They also identify barriers to the implementation of these project-types thus providing critical information for the assessment of a baseline's additionality, as required by the rules for the CDM and JI.

The briefs do not provide information on other BAVMVC related tasks, especially protocols for the monitoring and verification of emissions reduced.

The consultant recommends to incorporate the information on barriers into the design of program-based BAVMVC related activities for the two project types wind energy and energy efficiency.

#### *5.2.4 Framework for Climate Change Technology Cooperation in Kazakhstan (TCAPP)*

TCAPP created an institutional capacity and implementation strategy to manage technology transfer. This is based on a detailed assessment of barriers to technology transfer, activities to remove barriers and identified the parties that would need to be involved in the implementation of these activities. While the barrier assessment work did identify institutional gaps for technology transfer, these are unrelated to the implementation of BAVMVC activities in the context of a high quality and high credibility GHG reduction program.

However, the work on barriers is valuable in the context of baseline construction for a range of project-types. Considering that the Kazakhstan government and key stakeholders were involved in this barrier assessment work could justify to award a high status to this information and regard it as pre-qualified for baseline assessment purposes. In order to strengthen the relevance of this information, one could seek to formally validate this information.

### 5.2.5 *Kazakhstan's first national communications to the UNFCCC*

Kazakhstan submitted its first national communications to the UNFCCC in 1998. It draws heavily upon the findings of the US country studies program and uses the baseline projections of that study in the section on mitigation measures. It comprises a histogram of GHG emissions by fuel and sector on a rather aggregate level. Considering the availability of more disaggregate figures for recent years, the data within the national communications is of limited use in the context of designing program-based BAVMVC related tasks.

## 5.3 **Questionnaire for program operators and project developers in the region**

In the absence of other materials that could assist in the process of assessing existing capacities to implement BAVMVC related activities, the consultant decided to design a questionnaire to portrait the current status quo of such capacities. The questionnaire is designed for potential JI/CDM project developers.

It should be made available in Russian as well as English. The questionnaire should be distributed by EPIC national consultants to foreign investors and domestic companies that already operate or plan to invest in energy sector as well as industrial assets in Central Asia.

The consultant recommends that EPIC personnel in cooperation with other government agencies creates a draft a list of companies that should receive a copy of the questionnaire.

The questionnaire is structured into five sections that seek to investigate different aspects of existing capacities related to:

- awareness of the climate change issue and incentives provided by JI/CDM for investors,
- availability of planning data and financial analysis tools for baseline assessment,
- monitoring of plant performance data and record keeping (i.e. fuel-use) for emission monitoring and verification purposes,
- existing skill-level of independent third party validators/verifiers, and
- assessment of the quality and completeness of program level criteria and guidance provided by national JI/CDM programs.

In order to increase the number of responses, the questionnaire is limited to a minimum number of questions that largely require check answers.

## **6. Identification of Procedural, Technical and Institutional Gaps**

This chapter identifies specific procedural, technical and institutional gaps and barriers for implementation of a high quality and high credibility GHG reduction program, related to BAVMVC. It also develops recommendations to close these gaps and thus reduce the barriers to the implementation of efficient and high-quality guidelines for BAVMVC related activities.

This chapter is based on the review of the project developers manual (Chapter 3) on the one hand and the requirements for the operation of a high quality GHG reduction program on the other.

This chapter treats the expertise that is displayed in the project developer's manual as the current status-quo of knowledge, procedures and institutional frameworks that exist for the execution of BAVMVC related activities in Kazakhstan. This chapter might need to be revisited when the execution of future tasks under this contract reveals that the current status is different from what is displayed in the project developers manual and/or results from the questionnaire become available.

### **6.1 Procedural issues**

This section identifies gaps related to the practical operation of the CCCC. It discusses the organization of administrative issues as well as procedures for the execution of BAVMVC related activities.

#### *6.1.1 Operations handbook*

The consultant recommends to develop an operations handbook that is to provide step-by-step guidance to the operation of the CCCC in relation to BAVMVC activities. The objective of the operations handbook should be to provide prescriptive and binding BAVMVC procedures that are administered by the CCCC. It should guide operators of the CCCC, project developers, government agencies and other stakeholders. It should become the main reference document. To develop an operations handbook is the consultant's single most important recommendation in the context of this assignment. The operations handbook should be developed from the basis of the current project developer's manual. Even though the manual in its current version lacks the prescriptive procedures that the operations handbook requires, it is useful as a starting point.

The operations handbook should describe the structure of the CCCC, its legal basis, administration, operational principles, how it interacts with parties interested to participate in the CCCC (i.e. in the capacity of investor, ERU/CER buyer, service provider), how it is governed, which functions it performs, how decisions are made and how it reports to the UNFCCC.

In this context, much can be learned from the work that has been executed for the government of Costa Rica on this issue. Its recently established Facility for Renewable Energy Resources uses an operations handbook that could provide useful elements for CCCC.

### *6.1.2 Integrating BAVMVC into the equipment licensing process*

The consultant recommends that in order to streamline administrative functions, BAVMVC related activities should be highly integrated into the already existing equipment licensing process. In essence, BAVMVC related tasks are very similar to tasks that need to be performed in the context of equipment licensing. This means that existing licensing procedures should be expanded to address BAVMVC related requirements and authority to administer BAVMVC related activities should be assigned to those entities that already handle equipment licensing in the different industries that are relevant from a JI/CDM perspective.

The consultant recommends to launch a process that includes the relevant stakeholders to develop procedures for the integration of BAVMVC related issues into the regular equipment licensing process.

### *6.1.3 Program platform*

The consultant recommends to bring the various aspect of BAVMVC related design issues in a multi-lingual web-site. Such a CCCC program platform would create a one-stop shop for all CCCC stakeholders. It would provide easy access to key resources, databases, desirable project types, market intelligence information, tools for the back-of-envelope assessment of project ideas, case studies and other supporting materials to reduce barriers to project development. The program platform could make a significant contribution to streamline program operation and provide services related to program operation online (such as the submission of project applications for approval purposes, pre-approved baselines, pre-approved monitoring plans and verification protocols for select project-types, etc).

While the development of a program platform goes beyond the scope of future tasks under this contract, the preparation of other materials should be implemented with the program platform recommendation in mind.

## **6.2 Technical issues**

This section identifies technical gaps related to the practical operation of the CCCC. It specifically discusses technical issues surrounding guidelines for baseline assessment, validation process, protocols for monitoring, verification and certification, pre-approved data, data management and program administration.

### *6.2.1 Pre-approving data, data monitoring, storage and management*

As pointed out in chapter 4, there is a lot of useful data in the project developer's manual as well as project-type specific assistance projects that becomes inaccessible for future users because of the way the data is organized (or rather not organized). A streamlined approach to data management could make a significant contribution to reducing BAVMVC related costs, which must be one of the prime objectives for the design of the CCCC.

The consultant recommends to launch a process to establish a data management system that would meet a variety of functions related to the facilitation of baseline development, project performance monitoring, verification, UNFCCC reporting and energy planning.

The implementation of such a process could be structured as follows:

- design of a proper functional framework that includes all required functions of the data management system, user access specifications and other design parameters,
- development of a relevant data model,
- programming of a corresponding database,
- data collection, verification and pre-approval,
- data entry, and
- data and system maintenance.

The development of a data management system is outside the scope of future tasks under this contract. However, CCCC personnel should commence with systematic data collection as soon as possible.

### *6.2.2 Technical manuals for BAVMVC*

The consultant recommends to launch a process to create technical manuals for baseline assessment, project concept validation, monitoring, verification and certification. These manuals should have two parts: a general part that is applicable for all projects and a project-type specific part. These manuals can draw upon already available experience. They should also be tailored to the national strategy related to the use of JI/CDM in the context of national economic development objectives. In the context of future tasks under this contract, the consultant will assist with the development of BAVMVC manuals for two relevant project-types.

The design of the manuals and methodologies used should be consistent with UNFCCC requirements. Ideally, the manuals should be validated by an independent third party (preferably associated with an international buyer of ERU/CERs). This reduces risks related to non-recognition of emission reductions and increases the value of emission reductions delivered by CCCC.

## **6.3 Institutional issues**

### *6.3.1 Roster of qualified service providers for BAVMVC related tasks*

The project developer's manual includes a list of international consultants, investors and donors. Lacking is an overview of national and international entities that can provide services in the context of BAVMVC related tasks.

The consultant recommends to create such a roster and involve members of the roster in the design process of program-based BAVMVC related tasks (such as drafting of technical manuals and monitoring protocols for specific project-types) in consultative capacities. In addition, the roster should be made available to interested project developers that seek to execute projects and require assistance with the preparation of BAVMVC related activities.

This effort will make a substantial contribution to building local capacities and fostering international cooperation and know-how transfer related to BAVMVC related tasks.

### 6.3.2 *Legislative/regulatory basis for the operation of the CCCC*

The consultant was not able to determine whether an effort to establish a legislative/regulatory basis for the operation of the CCCC exists or is currently being prepared. One source stated that “CCCC has become the central clearinghouse for official policy regarding the COP negotiations and project pipeline development including eventual national certification and inventorying;” however, the source did not make reference to a legislative or other action that defines the authority that was transferred to CCCC.

Such a legislative initiative would need to transfer authority related to a number of BAVMVC related tasks, such as provisions assigning authority to administer BAVMVC related functions, such as accrediting “operational entities,” enforcing the quality of the operation of the accreditation body as well as operational entities, accepting project applications, issuing/confirming project validations, certifying emissions reductions, maintaining a registry of emissions and emission reductions and report international transactions of ERU/CERs to the UNFCCC.

## Glossary

Activities implemented jointly, AIJ	Under a pilot phase that ends by 2000, according to Art. 4.2 UNFCCC, AIJ activities can be carried out through partnerships between an investor from a developed country and a counterpart in a host country. The purpose is to involve private-sector money in the transfer of technology and know-how.
Additionality	<p>A verifiable demonstration or proof that a project would not have been undertaken if it were not for its greenhouse gas mitigation benefits. Reference should be made to suitable regulatory, technology-related, financial as well as market-related parameters that show:</p> <ul style="list-style-type: none"> <li>• the emission reduction was not required by law,</li> <li>• the technologies that deliver the emission reduction are innovative,</li> <li>• the value of the emission reductions improve the financial performance of the project above a threshold criteria and</li> <li>• the emission reductions contributed to overcoming market and other barriers.</li> </ul>
Afforestation	The act or process of establishing a forest on land that had not been forested in relatively recent history
Annex B	Refers to Kyoto Protocol Annex B, a listing of the Annex I Parties with their commitment to emissions reductions
Annex I	UNFCCC Annex I. List of countries that have committed themselves to a quantitative GHG emissions reduction target (OECD members plus most Central and Eastern European Countries).
Annex II	UNFCCC Annex II List of countries that have a special obligation to help developing countries with financial and technological resources. (OECD members plus the European Union)
Assumptions	The initial hypotheses built into the project
Banking	The act of carrying forward emission reduction units, certified emission reductions or emission rights that were either generated, purchased or allocated but not used towards emission limitation objectives in one commitment period to the next such period
Baseline	A projected level of future emissions against which reductions by project activities could be determined. The baseline shows greenhouse gas emissions or sink enhancement that would have occurred in the absence of the project activity.

Baseline document	A document describing forecasted emissions without the project during each year of the crediting period as compared to the project. The document includes the projected emission reductions to be generated by the project as established on the basis of this comparison
Baseline study	Document which objectively and systematically establishes the situation that would have occurred without starting the specific JI-project, regarding GHG emissions by means of measurements and calculations
Baseline validity period	The period of time for which the validity of a baseline is approved for a JI/CDM project. A baseline must be reviewed at the end of the baseline validity period. At that stage, the baseline can either be extended or adjusted to new circumstances. Accumulated baseline extensions can not exceed the crediting period.
Carbon credit	Generic term for all kinds of GHG emission reductions from project-based activities including emission reduction units and certified emission reduction units
Clean development mechanism, CDM	The Kyoto Protocol (article 12) establishes the CDM to enable industrialized countries to finance emissions-avoiding projects in developing countries and receive credit for doing so.
CDM Adaptation Fee	Potential fees charged to projects or national bodies as a share of proceeds according to Art. 12 Para. 8 of the Kyoto Protocol; to be used to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation.
Certification	Written assurance by an independent and qualified organization that the project has, during a specified time period, achieved the verified reductions
Conference of the Parties, COP	The COP is the supreme body of the Convention. It currently meets once a year to review the Convention's progress.
Crediting period	Period of time in which the project developer can claim emission reductions; limited at maximum to the end of a project's life or to when it becomes non-additional
Certified Emission Reduction Unit, CER	Reduction or sequestration of GHG emissions by 1,000 kg CO <sub>2</sub> -equivalent resulting from a project in a non-Annex I country aimed at reducing man-made emissions (Art 12) that count towards binding emission limitation objectives, calculated in accordance with decision 2/CoP3



Emission factor	A coefficient that relates the activity data to the amount of chemical compound which is the source of later emissions. Emission factors are often based on a sample of measurement data, averaged to develop a representative rate of emission for a given activity level under a given set of operating conditions
Emission Reduction Unit, ERU	Reduction or sequestration of GHG emissions by 1,000 kg CO <sub>2</sub> –equivalent resulting from a project in an Annex I country aimed at reducing man-made emissions (art 6.3 KP) during the five year commitment period 2008–12, calculated in accordance with decision 2/COP-3
Greenhouse gases, GHG	Gaseous constituents of the atmosphere, both natural and man-made, that absorb and re-emit infrared radiation, not covered by the Montreal Protocol. The major GHG is water vapor, and also Carbon dioxide (CO <sub>2</sub> ), Methane (CH <sub>4</sub> ), Nitrous oxide (N <sub>2</sub> O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF <sub>6</sub> )
Host country/party	The country (company, organization or individual) that implements a project in its premises as an act of JI project
Indicators	Factors that will indicate whether the project is running effectively. Indicators are used: to measure progress towards immediate and wider objectives; to assess inputs and measure outputs; to indicate changes in the development of the project. Indicators may be: independent, verifiable, specific, accessible, sufficient number and detail (qualitative).
Implementation	All activities carried out specifically to secure that the project as described in the project design documents, the baseline study and the monitoring plan is put into operation
Investor country/party	The country (company, organization or individual) that invests in a project on a host party's premises as part of a JI or CDM project
Intergovernmental agreement	Agreement between the governments of the acquiring and host countries regarding overall cooperation with respect to JI or CDM (for example Memorandum of Understanding, Letter of Intent, Agreement, Treaty, and Protocol)
Joint Implementation, JI	The fulfillment of the reduction commitment under art. 3 KP by one country (acquiring country) through acquiring, in accordance with art. 6 KP, the ERUs resulting from projects in another country

Kyoto Protocol, KP	UNFCCC protocol regarding the ultimate objective of achieving quantified emissions limitation and reduction commitments. Protocol becomes effective after it is ratified by no less than 55 countries that also signed the UNFCCC, on share which receipt for a minimum of 55% of aggregate world CO <sub>2</sub> emissions for 1990.
Leakage	An unexpected increase in GHG emissions, or a decrease in GHG sequestration, caused by the project activity outside the project boundaries, but not accounted for in the project baseline
Monitoring	Periodic systematic surveillance/measurement of a project's performance and impact. It involves collecting project data on greenhouse gas emissions reductions or other impacts that occur as a result of the project by direct measurement, and comparing it with the pre-established baseline
Monitoring plan	Plan describing all relevant activities for registration, monitoring and measurement to provide transparent and verifiable information on project performance and number of ERUs/CERs generated
Monitoring report	Report prepared by the project developer recording the outcome of the monitoring process
Operational entity	<i>See Validation/Verification body</i>
Operations	All activities carried out specifically to ensure that the project meets the requirements as described in the project design documents, the baseline study and the monitoring plan
Project	An activity undertaken in the context of the Kyoto Protocol's JI/CDM mechanism, which intends to generate emission reductions compared to what have occurred in the absence of the project
Project boundaries	The project's defined geographical limits, its lifetime and its intended use of resources and technology
Project organization	Company, corporation, firm, enterprise or institution, responsible for the JI/CDM project implementation
Preventive action	Action taken to eliminate the causes of a potential project defect or other undesirable situation in order to prevent occurrence
Project management	Overall management function responsible for the performance and conformity of the project in all stages (design, implementation and operation) from first application to end of the contract period

Registration	Formal acceptance by the executive board of a validated project as a CDM/JI activity. Registration is a prerequisite for the verification, certification and issuance of CERs related to that project activity.
Reforestation	The act or process of re-establishing a forest on land that had been deforested in relatively recent history.
Sink	Any process, activity or mechanism that removes GHG, an aerosol or precursor of GHG from the atmosphere
Source	Any process, activity or mechanism that releases GHG, an aerosol or precursor of GHG into the atmosphere
Stakeholders	People, groups, organizations and communities involved in, benefiting from, (or impacted by) the project
Transaction Costs	? an be classified into: 1) the cost regarding the project finding, the evaluation, and the management of the project, and 2) the cost specially generated as JI /CDM (application, documentation, demonstration, monitoring, distribution of credits, etc.)
Validation	Confirmation by examination and provision of objective evidence by an independent and qualified organization before registration that the project design documents, the baseline study and the monitoring plan meet prescribed requirements. Validation includes the confirmation that the emission reduction as claimed by the project are considered realistic
Validation/verification body	An independent body, recognized by the pertinent government—or its representative—as being capable of validating and verifying projects, based upon the regulatory requirements
Validator/verifier	Person qualified to perform validations/verifications. By meeting the relevant regulatory requirements and those of the validation/verification body
Verification	Confirmation by examination and provision of objective evidence by an independent and qualified organization that the project emission reductions are achieved and that other JI/CDM requirements are met
Verification criteria	Set of policies, procedures or requirements against which collected verification evidence are compared. Criteria are the UNFCCC requirements and those incorporated in the project design documents, the baseline document and the monitoring plan

## *Appendix 1*

### **Production Costs and Value Added in the ERU/CER Production Process**

#### **1. Factors Driving Costs in ERU/CER Supply**

Table A1.1 explains key cost components of the ERU/CER production process. For every cost component, factors driving cost as well as the entities that control costs are also identified. For purposes of this analysis, a small project is defined as a project that delivers up to 5,000 carbon credits for six years and a large project as a project that delivers 500,000 carbon credits for ten years.

##### *Technical abatement costs*

The technical abatement costs are the net added costs to reduce or sequester emissions compared to an alternative baseline investment. These costs include fixed investment as well as variable costs. They are driven by the nature of eligible baselines in the project country and the costs for the proposed mitigation technology. This means that they are largely determined by conditions in the project country and related to factors such as: economic growth and development plans in the agricultural, forestry, energy and industrial sectors, general investment environment, including policies for technology import and promotion of climate-friendly technologies, existing fuel mix in the economy, and age and condition of the existing technology inventory.

Using as an example benchmark total production costs of US\$6.00 (all cost stages accounted), the market would support projects with original net present technical abatement costs of US\$1.32–US\$2.55 for small projects and US\$2.60–US\$3.67 for large projects (at a discount rate of 8%). In the table below, the various cost components that make up total production costs for ERU/CERs are explained.

##### *Costs to achieve mandatory side benefits*

Mandatory side benefit costs occur to ensure that the project produces the required amount of sustainable development benefits that are unrelated to reducing GHG emissions as well as achieving other investment objectives but to meet JI/CDM rules that require JI/CDM projects to contribute towards local sustainable development objectives. This is a mandatory criterion for all JI/CDM projects and could require investors to implement project components that are unrelated to primary investment objectives as well as GHG emissions mitigation. Such side benefits could be related to socio-economic issues, such as poverty alleviation, rural development, local environmental benefits or gender development. These costs are largely determined by project location, project type as well as conditions in the project country. The consultant assumes that mandatory side-benefit costs account for roughly US\$0.50 per carbon credit for small and large projects alike.

**Table A1.1 ERU/CER Production Cost Components**

Cost Component	Cost drivers	Cost control	Cost Component Description
<b>Tech. Abatement costs</b>	Project-type	Project	Investment and variable costs that can be allocated to achieving a reduction of GHG emissions below baseline levels.
<b>+ Costs to achieve mandatory side-benefits</b>	Project type, nature of sustainable development requirements		Investment costs that can be allocated to produce the required amount of sustainable development benefits that are unrelated to reducing GHG emissions as well as other investment objectives.
<b>+ Quality costs</b>	Nature of non-mandatory side benefits, marketing/branding effort		Costs to differentiate a JI/CDM project and the ERU/CERs it generates to find buyers that value such differentiation. This could include costs to achieve non-mandatory side benefits as well as marketing costs to advertise quality aspects to potential buyers.
<b>+ Delivery risk costs</b>	Quality of project prep., reliability of national JI/CDM regime	Program	Costs related to the risk profile of a project to deliver the planned amount of ERU/CERs over the length of the project life.
<b>+ Regulatory costs</b>	Project size, project type, national JI/CDM regime		Costs to meet JI/CDM requirements related to project validation, baseline development and approval, emissions monitoring, reporting, verification and certification as well as additional national requirements specific to the implementation of JI/CDM projects in that country.
<b>+ Transaction costs</b>	Project size, market liquidity		Costs related to the marketing and transfer of ERU/CERs, including costs for i.e. contract development, negotiation and settlement borne by the seller.
<b>+ Contribution to adaptation</b>	The base and level of Art. 12 p.8 “share of proceeds”	MOP, CDM Exec. Bd	Costs related to the payment of a share of precedes Art. 12 Para. 8 to be used to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation.
<b>= Production costs</b>			
<b>+ Commissions</b>	Brokerage, finders fees		Transaction based fees paid to third parties that facilitated a transaction.
<b>+ Margin/Profit</b>	Investor expectations		The expected return to compensate the investors for the risks taken and resources provided.
<b>= Reservation sales price</b>			

*Quality costs*

Quality costs relate to expenditures that differentiate a JI/CDM project (and the carbon credits it generates) with the objective to find buyers who value such differentiation. Quality costs include costs to achieve non-mandatory side benefits as well as marketing costs to “brand” JI/CDM projects or to advertise certain quality aspects to potential buyers that are willing to pay above prevailing market conditions for higher quality carbon credits. These costs are voluntary and are not included in the subsequent analysis.

*Delivery risk costs*

Delivery risk costs arise to ensure that the contracted amount of carbon credits can be delivered to buyers over the length of carbon credit purchase contracts. Delivery risk costs to the producer are dependent upon project-based non-performance risks, the regulatory environment of JI/CDM projects, as well as the availability of instruments, such as state guarantees, to mitigate such risks. Sources of delivery risks include:

- Certification risks: in the absence of clear JI/CDM rules for the certification of emission reductions, project operators run the risk that their emission reductions are not recognized and therefore are not valuable for emitters that seek compliance with emission limitation objectives. Certification risks are driven by the quality of national JI/CDM programs.
- Baseline risks: external factors could trigger the need for baseline revision. Such external factors could include macro-economic policy changes, unexpected price developments in relevant markets, or technology breakthroughs. Large projects (with longer crediting periods) are more exposed to this risk compared to small projects (with short crediting periods).
- Project performance risks: non-conform equipment operation & maintenance as well as poor project management could result in under-performance related to the production of side benefits, emission/sequestration rates or total output delivered. This risk is largely controlled by project operators and their suppliers.

Hedging against these risks creates average costs of US\$0.15 per carbon credit.

*Regulatory costs*

Regulatory costs relate to meeting mandatory procedures for JI/CDM, national programs and buyers for project validation, baseline development & approval, emissions monitoring, reporting, verification and certification. They are controlled by how national JI/CDM program administrators have implemented the guidance provided by the COP/MOP and the CDM Executive Board and how well they have integrated their national JI/CDM program with other relevant investment regulations. Regulatory costs are related to factors such as:

- the degree of standardization in the JI/CDM project/baseline validation, approval, monitoring and verification process,
- the quality and transparency of applicable rules, procedures and protocols, and
- the integration of the JI/CDM approval process with other relevant permitting and investment approval processes.

Based on existing experience, the consultant estimates that regulatory costs total roughly US\$50,000 for a small project and US\$250,000 for a large project. The regulatory costs for a small project include:

- simple baseline document based on standardized elements with low burden of proof requirements,
- standard monitoring and verification (M&V) protocol for the project-type that can be adopted for the project with minor changes and simple monitoring plan,
- low effort project validation and approval,
- three verifications and certifications.

The regulatory costs for a large project include:

- detailed baseline document with high burden of proof requirements and one revision after 5 years of operation,
- detailed M&V protocol and detailed monitoring plan,
- multi-agency involvement based project validation and approval,
- five verification and certifications.

#### *Contribution to adaptation*

The adaptation fee is stipulated in Art. 12 Para. 8 of the Kyoto Protocol as “a payment of a share of proceeds” from the value of a CDM related CER transaction. It was introduced to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation. The level of the fee is still being negotiated. Some proposals call for a fee representing 30% of the agreed transaction price of CERs to be paid by its buyer. The MOP/COP and/or the CDM Executive Board will set the adaptation fee in the future. At this point, the adaptation fee only exists for the CDM thus adding a comparative disadvantage to the CDM. However, a similar fee for JI has been suggested. For purposes of this analysis, the consultant works with an adaptation fee for the CDM of 20% of carbon credit transaction value.

#### *Transaction costs*

Transaction costs relate to the marketing and transfer of carbon credits. This includes costs for contract development, negotiation and settlement that are borne by the seller. These costs are determined by market maturity, the comparative strength of supply and demand, as well as seller experience in the market. Transaction costs will become a non-issue over time.

The consultant estimates that transaction costs total US\$0.10 per carbon credit for small projects and US\$0.03 per carbon credit for large projects.

#### *Total production costs*

All of these cost factors together constitute the production costs for ERU/CERs that are borne by carbon credit producers.

Figure A1.1 provides an overview of the relative contribution of cost components to total production costs. The estimate is based on US\$6.00 production costs per carbon credit unit.

Estimates are based on available project development cost data and consultant experience. According to that figure, 6% (large projects) to 41% (small projects) of production costs are controlled on the program level (delivery risk costs, regulatory costs and transaction costs). The consultant estimates that program level controlled costs can be reduced by 50% through program design, i.e. by streamlining project approval procedures, pre-defining baselines and M&V protocols for different project types and developing standard delivery risk reduction instruments.

This would reduce total production costs by US\$0.02 (large projects) to US\$0.83 (small projects) per carbon credit which can be used to increase the profitability of the program or finance projects with higher technical abatement costs.

#### *Commissions and profits*

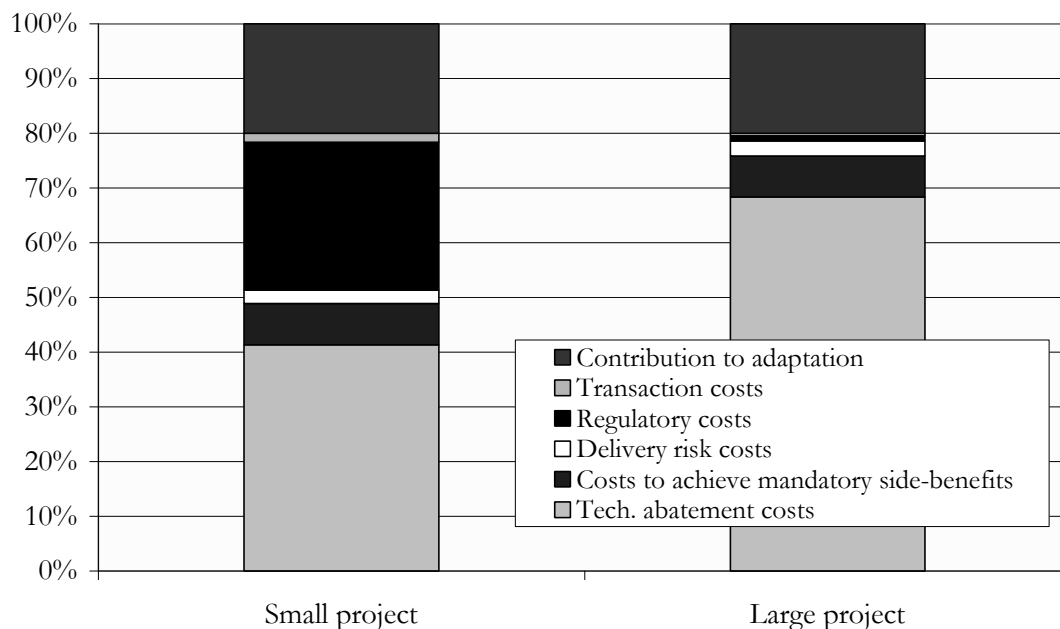
Brokers typically receive between one to three percent of the value of a transaction for their services. Profit expectations depend on the perceived investment risk and typically lie between 15–30 percent (and higher) in investment grade emerging economies.

#### *Reservation price*

The reservation price is the minimum transaction price that must be agreed between the buyer and the seller to make a CDM investment and production of CERs from that project worthwhile.

**Figure A1.1 Relative shares of cost components for large and small emission reduction projects**

Percent of total  
production costs





## 2. Factors Driving Value in CER Supply

Table A1.2 displays value components in the ERU/CER production process. For every value component, the figure displays value driving factors as well as the entities that control value.

### *Produced emission reduction*

The delivery of emission reductions is the source of all other value-added components in the ERU/CER production process. The delivery of emission reductions is controlled by project operators. Projects should deliver emission reductions equivalent to or exceeding expected amounts. Historic transactions suggest that the value of an uncertified emission reduction that does not offer any other side benefit is estimated at US\$0.30.

### *Mandatory side-benefits*

In addition to emission reductions, projects deliver sustainable development benefits that are required under CDM rules equivalent to or exceeding expected amounts. Failing to do so, could call into question the convertibility of carbon credits generated by a project to CERs and thus the contribution of carbon credits towards buyer emission limitation objectives. Mandatory side benefits increase the value of emission reductions because they increase the likelihood of being eligible under the CDM. The consultant estimates that mandatory side benefits add about US\$0.70 of value to an emission reduction.

### *Non-mandatory side benefits*

The delivery of other non-required side benefits allows project operators to differentiate their CERs and sell them above prevailing market prices. Such non-mandatory benefits could have a value for some and not for other buyers. They are excluded in the further analysis.

### *Avoided ERU/CER delivery risks*

Buyers place a higher value on streams of carbon credits that carry very little or no risks related to their contribution towards buyer emission limitation objectives over the length of the purchasing period. Program operators or third parties supply such risk reduction measures. The value of such measures is related to the perceived avoided risk, which the consultant estimates to be US\$0.90.

### *Conformity of M&V protocol, baseline, government approval with JI/CDM rules*

The conformity of projects that generate emission reductions with guidelines for project validation, baseline development, approval, emissions monitoring, reporting, verification and certification with JI/CDM rules is the primary source of value for buyers that seek to use emission reductions towards their emission limitation objectives. We estimate that the value of emission reductions increases by US\$2.80 per unit when the project is in conformity with these guidelines and have been approved.

### *Ease of sourcing*

The quality of the infrastructure and instruments used to organize the sourcing of carbon credits will have some influence on the value of emission reductions for buyers. The value of marketing is the avoided search and contracting costs for the buyer and is estimated to be US\$0.10 per unit.

**Table A1.2 Value-added components in the CER production process**

Value Component	Value drivers	Value control	Value Component Description
<b>Produced emission reduction</b>	Project-type and operation	Project	The delivery of emission reductions equivalent to or exceeding expected amounts.
<b>+ Mandatory side-benefits</b>	Project type and operation		The delivery of sustainable development benefits that are required under CDM rules equivalent to or exceeding expected amounts.
<b>+ Non-mandatory side benefits</b>	Project type and operation, marketing/ branding efforts		The delivery of other non-required side benefits that are used for marketing/branding efforts equivalent to or exceeding expected amounts.
<b>+ ERU/CER delivery risk reduction measures</b>	Design of national JI/CDM program and role of specialised intermediaries	Program	Measures that reduce buyer risks that the carbon credits delivered are not recognised to contribute towards buyer emission limitation objectives over the length of the purchasing period.
<b>+ M&amp;V protocol, baseline, govt. approval</b>	Operations handbook of national JI/CDM program, regulatory structure for project approval		The quality of guidelines for project validation, baseline development and approval, emissions monitoring, reporting, verification and certification according to JI/CDM rules as well as the level of effort involved and assistance provided to apply these guidelines on the project level.
<b>+ Ease of sourcing</b>	Marketing infrastructure		Infrastructure and instruments used to organise the sale of carbon credits from FRER to buyers.
<b>+ Contribution to adaptation</b>	The base and level of Art. 12 p.8 “share of proceeds”	MOP, CDM Exec. Bd	Payment of the adaptation fee is necessary to convert emission reductions into CERs.
<b>= Production value</b>			
<b>+ Producer rent</b>	Producer expectations		The expected return to compensate the producer for the risks taken and resources provided.
<b>= Reservation sales price</b>			

### *Contribution to adaptation*

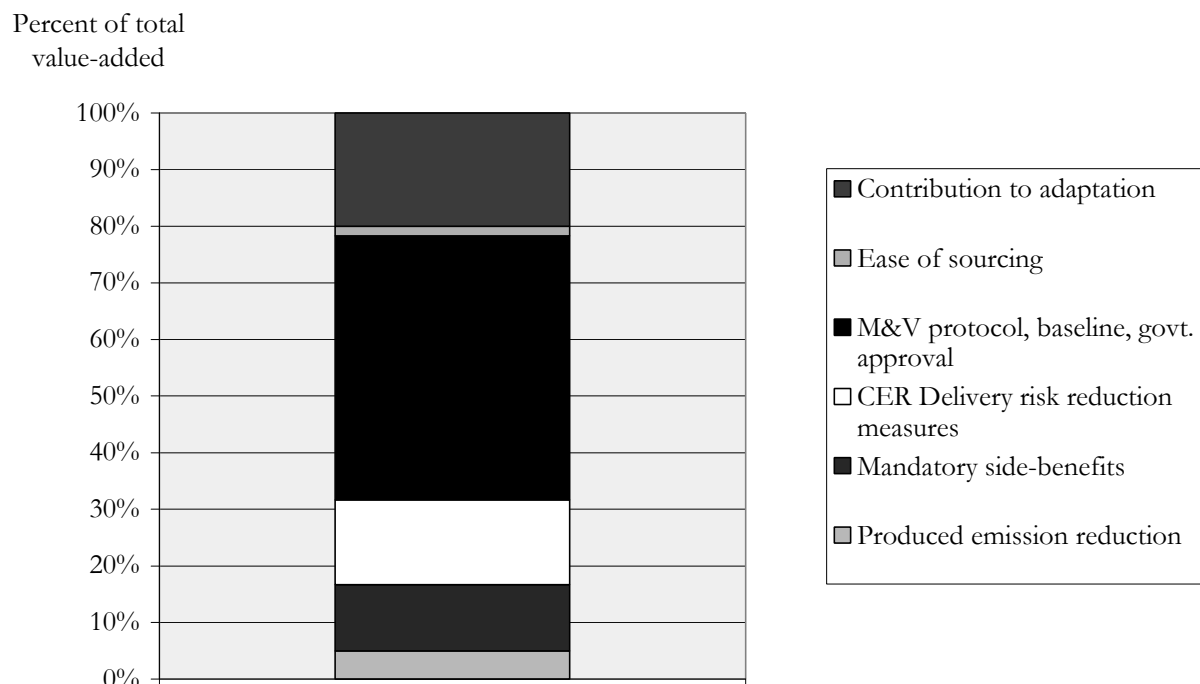
Emission reductions meet all CDM requirements when the adaptation fee has been paid. They then become fully useable to contribute to emission limitation objectives under the Kyoto Protocol and do not carry further conversion risks for buyers. The value of the contribution to adaptation is equivalent to the adaptation fee which is estimated at 20% of the transaction value or US\$1.20.

### *Total value added*

Figure A.1.2 provides an estimate of the relative contribution of value components to a total US\$6.00 production value per carbon credit unit. According to that figure, 64% of production value is controlled on the program level (M&V conformity with the JI/CDM, avoided delivery risks and ease of sourcing).

The consultant estimates that insufficient program design could lead to the production of emission reductions that would not be recognized by the CDM in the worst case. In that case, the program would not add any value to emission reductions.

**Figure A.1.2 Relative shares of value components in the carbon credit production process**



*Appendix 2*  
**Questionnaire for Potential Project Developers**

**Questionnaire for Energy and Industrial Companies that Build, Own or Operate Assets in Central Asia that Emit Greenhouse Gases or Avoid the Emission of Greenhouse Gases**

Please respond to the thirteen questions below. The purpose of this survey is to:

- assess the current awareness of companies operating in Central Asia of new financial opportunities associated with reducing greenhouse gas emissions (in the context of the Clean Development Mechanism),
- assess the capacity of companies operating in Central Asia to capitalize on such opportunities, and
- receive comments on government efforts and new measures that government should take to facilitate investment in technologies, processes and products that reduce the emission of greenhouse gases in the context of the Clean Development Mechanism.

**Awareness of the climate change issue and incentives provided by Joint Implementation/Clean Development Mechanism to reduce emissions of greenhouse gases**

*Instruction: Please respond to the questions below. If you answer “yes” please supply explanatory/more detailed information.*

1. Are you aware of international efforts and national programs that provide financial incentives for technologies, processes and products that reduce the emission of greenhouse gases?

☐ Yes ☐ No

Elaborate if yes:

2. Have you researched or submitted requests to public agencies or private agencies related to investigate the possibility of producing and selling certified emission reductions?

☐ Yes ☐ No

Elaborate if yes:

**Investment planning and assessing the value-added generated by reducing emissions**

3. Have you considered the potential value from reducing greenhouse gas emissions (through selling of certified emission reduction credits) in your own financial analysis of investment options that are available to you in Kazakhstan.

☐ Yes ☐ No

Elaborate if yes:

4. If you answered question 3 with “yes,” could the opportunity to sell emission reduction credits have a decisive impact on your investment decision?

☐ Yes ☐ No

Elaborate if yes:

5. What is the source of planning and market outlook data that you use as a basis in preparation of financial assessments of investment options in Kazakhstan?

*Instruction: Please provide additional information on every response that you have checked.*

☐ Company internal ☐ Government ☐ Consultants ☐ Other

Additional information:

**Monitoring of technical plant performance and maintaining data records**

6. Do you maintain plant-level energy-use data from your existing operations in Kazakhstan and if yes, please elaborate on how this data is generated and recorded?

☐ Yes ☐ No

Elaborate if yes:

7. Have you created inventories of greenhouse gas emissions for the direct sources of greenhouse gas emissions that you operate and if yes, elaborate on the methodology used?

☐ Yes ☐ No

Elaborate if yes:

8. Do you have the capacity to project future development of a) energy use of existing operations and b) future emissions of greenhouse gases?

☐ Yes ☐ No

Elaborate if yes:

**Availability and skill level of entities that can provide independent verification of recorded plant performance data**

9. According to your assessment, are you aware of organizations operating in Kazakhstan who would be qualified to verify and certify the technical performance of equipment and energy use of your existing operations in Kazakhstan? Such entities could be engineering consultants, accounting firms as well as dedicated verification/certification bodies.

☐ Yes ☐ No

Identify such entities and elaborate if yes:

10. If you answered question 9 with “yes” have you worked with entities identified above?

☐ Yes ☐ No

Elaborate if yes:

**Barriers to consider participation in the Clean Development Mechanism**

11. In an overall assessment, do you feel sufficiently prepared to take additional steps towards investment decisions that would reduce greenhouse gas emissions in Kazakhstan?

☐ Yes ☐ No

Elaborate (yes and no answers):

12. If you answered question 11 with “no” please identify the barriers that make it unfeasible for you to consider such investment decisions at this point?

- a) barriers related to the demand for emission reduction credits
- b) barriers related to the national framework that would be required to execute such investment decisions
- c) barriers related to your own capacity to execute such investment decisions
- d) other barriers

13. What would you need to strengthen your own efforts in the pursuit of reducing greenhouse gas emissions (i.e., by investing in higher energy efficiency equipment, renewable energy technologies and other technologies, products and processes that reduce greenhouse gas emissions)?

- a) from the Government of Kazakhstan
- b) from within your own company
- c) from buyers of emission reduction credits
- d) from other parties

### *Appendix 3*

## **Table of Contents for an Operations Handbook for the CCCC**

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- 7. Article VII: Trustee and Functions
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- 8. Article VIII: Reporting Mechanism to UNFCCC

Annex I: Project Selection Criteria

Annex II: Project Portfolio Criteria

Annex III: Draft Guidelines for Social Impact Assessment

Annex IV: Draft Guidelines for Environmental Analysis

*Appendix 4*  
**List of Supporting Documentation**

- ERUPT criteria for baseline assessment, monitoring and verification
- PCF Implementation Note 3
- PCF Implementation Note 4
- PCF Project Idea Note
- PCF Project Concept Note
- PCF Preliminary Validation Manual
- PCF Example baseline study
- FCCC/SB/2000/10/Add.2
- GHGprotocol.org core document